REMARKS

Remarks concerning to the Final Office action mailed 03/29/04 including the amendments of the preceding page are presented.

Remarks are listed by following items of the detailed action.

Response to Arguments

2.-1 ; (1st block of item 2)

Applicant's arguments filed 12/23/03 have been fully considered but they are not persuasive. Applicant argues that Hoagland (5309241) does not disclose a fixed focus input image optical system having a function of compressing the circumferential part part of the input image, nor a zoom image input method that enables a zooming without degrading the resolution, by including a fixed focus input image optical system. The examiner respectfully disagrees with this assessment of the reference.

Hoagland teaches the anamorphic fiber optic taper (106) tapers the input image from the outside (circumferential part) to inside and therefore does compress more largely as moves to the circumferential part (see figure 3). That is, most of the compression is performed on the outer, circumferential part, of the image rather than on the inner part of the image.

The applicant received the examiner's response to arguments. But the applicant respectfully disagrees with the response of arguments.

At first, the applicant cannot agree the explanation of the examiner that "Hoagland teaches the anamorphic fiber optic taper tapers the input image from the outside (circumferential part) to the inside". That is, the fiber optic taper does not tapers the input image from the outside(circumferential part) to inside, but it tapers the input image from its input face to its output face along its taper.

The explanation that the image compression of the fiber optic taper tapers the input image from the input face to the output face along its taper in proportionally, is seems to be incorrectly substituted to the explanation that as if the image is compressed "from the outside (circumferential part) to the inside" at the output face, alluding to extend the explanation to non-linier local compression of the image concerning to its circumferential part that Hoagland never teaches.

And further extended explanations of "therefore does compress more largely as moves to the circumferential part (see figure 3)"and "That is, most of compression is

performed on the outer, circumferential part, of the image rather than on the inner part of the image" are deductions that entirely isolated from Hoagland, and Hoagland never teaches them.

But, what disclosed by Hoagland is that the anamorphic fiber optic taper changes the dimension of the image to the height and width respectively (c3,line55-58,66-68; c4,line1-7), by stretching shorter or wider(c5,line8-12), with the selected proportionality factor defining the magnification for vertical and horizontal axes (c5,line54-66). And Hoagland does not have any disclosure concerning to such a non-linear compressions described in this extended explanation because they are not needed, but this invention have them to realize the electronic zoom function. These cannot but be regarded to be far-fetched incorrect explanation by a incorrect syllogistic logic that extended from the incorrectly substituted above explanation.

Further, concerning to figure 3 of Hoagland that the examiner comments to see, figure 3 does not show the compression from the outside to the inside, but shows proportional image compression by the linear taper. And also to make sure in figure 3, the upper side of image 302 seems to be concentrated to a point at the face 104, but it does not mean to be compressed, but only is seen to be a point in this figure as the face 104 is turned perpendicularly to the side.

Accordingly, these explanations are utterly different from Hoagland, and can never find in Hoagland's disclosure including its figure 3 that does not have any localized compression within the output face.

2.-2 ; (2nd block of item 2)

> Furthermore, it is well known in the art that changing the zoom of an image, particularly anamorphic zoom, equates to the changing of aspect ratio of an input image. Therefore, the invention of Hoagland teaches a zoom function by changing of the aspect ratio of an image, and Hoagland does this without degrading the resolution of the image (col 3, line67-col 4,line6)

Further, the examiner explains that "it is well known in the art that changing the zoom of an image, particularly anamorphic zoom, equates to the changing of the aspect ratio of an input image". But the applicant cannot agree the explanation. Because in the explanation the "taper function" in Hoagland is incorrectly substituted to the "zoom function", assuming the taper function of Hoagland is as if the zoom function. But Hoagland never teaches the zoom function.

It is already clearly disclosed in this invention that the anamorphic lens (represented by cinemascope) cannot realize the zoom function of this invention, and is entirely different from this invention (Page9, Lines25-31).

As is well known, zooming function is to realize various output images with varied image angles as the zoom outputs. And "anamorphic" means to compress or expand to the vertical and horizontal direction in different magnification respectively. So, anamorphic and zooming is entirely different matter. And "anamorphic zoom" does not exist in the art.

An anamorphic taper of Hoagland can transfer only one pre-fixed aspect ratio, and does not have the zoom function.

Accordingly, the correct expression of the argue above is "it is well known in the art that changing the taper of an image, particularly anamorphic taper, equates to the changing of the aspect ratio of an input image".

And, the next explanation "therefore, the invention of Hoagland teaches a zooming function by changing of the aspect ratio of an image, and Hoagland does this without degrading the resolution of the image." is also incorrect. As is explained above Hoagland never teaches a zooming function but teaches a pre-fixed taper function. Not to mention to the function of "doing this without degrading the resolution of the image", that of course cannot find any disclosure of the electronic zooming without degrading image resolution in Hoagland (including col 3, line67-col 4, line6).

Accordingly, Hoagland does not indicate any description concerning to the zoom function of this invention at all.

2.-3 ; (3rd block of item 2)

> Applicant further argues that Hoagland does not teach compressing the circumferential part of the input image to all directions. However, Hoagland explicitly teaches compressing the circumferential part in the horizontal and vertical directions, and when the horizontal and vertical compressions are performed, these compressions "combined" would result in diagonal compressions as well, thereby compressing the circumferential part of the input image to all directions.

The anamorphic fiber optical taper that changes the aspect ratio compresses the image limited to the vertical and horizontal directions as is explained by Hoagland.

When compressions that limited to vertical and horizontal directions are performed, compressions "combined" shows to extend (that means to reduce the degree of

compression) to the diagonal direction and the diagonal line indicates the combined vector value of the vertical and horizontal components (for instance, it extends $\sqrt{2}$ times when vertical and horizontal components are the same). It is needed essentially to maintain the aspect ratio rectangular at the output, and it does not mean to compress to diagonal or all direction. As the result, the rectangular aspect is maintained after compression with the changed aspect ratio.

If the image is further compressed to all direction as this invention, as the image is also compressed to the diagonal direction, the compressed rectangular input image becomes to the barrel shaped output image as is shown at this invention in 4B of Fig4, comparing to 1B of Fig1 that is compressed only to vertical and horizontal direction.

Accordingly, the image compression to all direction for zooming of this invention is explicitly different from Hoagland that compresses the image limited to vertical and horizontal directions to make the change of the pre-fixed aspect ratio in rectangular.

2.-4 ; (4th block of item 2)

> It is noted that the Applicant appears to argue that the Applicant' s invention differs from Hoagland by realizing the zoom function through data processing. However, claim 7 specifically recites that the "electronic zoom image input system" uses an "input image optical system having a function of compressing the input image...". A similar recitation is found in figure 8. The examiner relies on Hoagland for this feature and interprets the recited "electronic" to refer to the fact that the device itself, which includes the recited compressing, is electronic, as is the Hoagland device. There is no recitation in the claims of a data processing operation that performs an electronic zoom function.

Actually, a fixed focus input image compressing optical system is used at this invention to get a compressed zoom input image, that contains non-linearly compressed zoom images of various angles prepared for various zoom output images. And the processing of electronic zooming for zoom output images of various image angles is done at the following image processing step of conversion unit through the processing of image conversion and correction from the compressed zoom input image, and output zoom images are taken out from the output. As the result, this invention realizes an electronic zoom function with the compressing optical system and the following image conversion electronic processing unit, that does not need to use a conventional variable focus complex zoom optical lens.

On the other hand, Hoagland also uses a pre-fixed anamorphic fiber optic taper

device simply to change an aspect ratio that is fixed to each taper device.

So, the optical device of this invention that is intended to get a compressed zoom input image for electronic zooming is perfectly different from the optical device of Hoagland in function and also in usage.

Claim Objection

3.;

3. Claim 7 is objected to because of the following informalities: the claim is a little confusing as written. Applicant is requested to more clearly claim the invention. Appropriate correction is required.

Claim 7 is corrected to make the claim clearer as is indicated in AMENDMENTS.

Claim Rejections - 35 USC § 112

5. 6.;

5. Claims 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 7 and 8 recite the limitation "the fixed focus input image optical system" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claims 7 and 8 are corrected to make claims distinct for the fixed focus input image optical system as are indicated in AMENDMENTS.

The fixed focus input image compressing optical system is used to form a compressed zoom input image, that can realize an electronic zoom input method with much smaller image sensor area comparing with using an optical system without image compressing. And the "image input device" is expressed as the "image sensor" to express the device more clearly.

7. 8.;

7. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly the subject matter which applicant

regards as the invention.

8. Claim 12 recites the limitation "having attachment conversion lens to change the focal length of the image input optical system" in lines 3-4 of the claim. It is not clear how a change in focal length is to be made to a "fixed focus input image optical system". Claim 12 appears to contradict claim 7.

Claim 12 is corrected to make the claim distinct for the conversion lens as is indicated in AMENDMENTS.

The total focal length of the fixed focus input image compressing optical system can be changed by mounting to it a conventional attachment conversion lens as is used in conventional camera. As the result, a different zooming range can be realized.

Claim Rejections - 35 USC 102

10 Claims 7, 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hoagland.

(Claim 7) ;

(Claim 7) As best understood by the language of the claim, Hoagland discloses a zoom image input method that enables zooming without degrading the resolution by including a fixed focus input image optical system (106) having a function of compressing the input image more largely as it moves to the circumferential part, the image input device preferably uniform pixel density, and the zoom image converting and correcting system (see arguments above; also col 3, Lines41-58, 66-68; col 4, Lines 1-6, 55-65; col 5, Lines 56-68; col 6, Lines 1-32).

Claim 7 is corrected to make the claim more clear as is indicated in AMENDMENTS. The applicant cannot agree above explanations of (Claim 7) by the examiner, because they are entirely different from Hoagland. As is described previously, these cannot but be far-fetched incorrect explanations, and cannot find any disclosure in Hoagland to prove these expanded explanations.

The optical system of Hoagland named (106) in this explanation is "the anamorphic optic taper" and is different from "the fixed focus input image compressing optical system" that Hoagland does not indicate any disclosure.

And also "a zoom input method that enables zooming without degrading the resolution, including the means for forming a compressed zoom input image by using a fixed focus input image compressing optical system having a function of compressing

the input image more largely as it moves to the circumferential part, receiving the compressed zoom input image by the image sensor providing preferably uniform pixel density, and processing the compressed zoom image converting and correcting by the conversion unit." is never disclosed by Hoagland (including col 3, Lines41-58,66-68; col 4, Lines1-6, 55-65; col 5, Lines56-68; col 6, lines1-32) who discloses to change the aspect ratio by using the anamorphic fiber optic taper.

Already, it has been clearly disclosed in this invention that the anamorphic lens (represented by cinemascope) that Hoagland discloses, cannot realize the zoom function of this invention, and Hoagland is entirely different from this invention (Page 9, Lines 25-31).

Furthermore, if such a non-linear compressing optical system as explained above is used to the image compression, as a rectangular input image is compressed to a barrel shaped non-linear output image just like the case of this invention as is shown in 4B of Fig. 4, it is essentially impossible simply to change a aspect ratio that Hoagland discloses. Accordingly, it becomes impossible for Hoagland to disclose such a non-linear compressing optical system explained above.

The applicant heartily appeals the just understanding to this invention.

(Claim 9) ;

(Claim 9) Hoagland further discloses the compression of the circumferential part of the input image is limited to to the vertical and horizontal direction (Col 4, Lines 55-65; Col 5, Lines 56-68; Col 6, Lines 1-32).

Claim 9 is corrected to make the claim clear as is indicated in AMENDMENTS.

Hoagland teaches to compress the input image by a pre-fixed fiber optic taper to vertical and horizontal directions to realize the rectangular out put image at the different aspect ratio.

But, this claim discloses that the compressed zoom input image distorted by the non-linear compressing optical system for the electronic zooming of this invention can also be realized by compressing only to the vertical and horizontal directions as a special case of zoom input image compression.

In this case, the degree of image compression is reduced a little bit, but can get rectangular shaped output image that is suitable to use conventional image sensors.

Concerning to the electronic zooming of this invention that needs non-linear compression, Hoagland does not teach or describe at all including in Col4, Lines55-65.

Accordingly, the image compression of Hoagland that concerns to changing aspect ratio is perfectly different from that of this invention that has a non-linearly distorted zoom image compression to realize the electronic zooming.

(Claim 10) ;

(Claim 10) Hoagland further discloses the image input device has a rectangular input image plane (see figure 3) and the optical system compress the circumferential part of the input image (see arguments above; also Col 4, Lines 55-65; Col 5, Lines 56-68; Col 6, Lines 1-32).

Claim 10 is corrected to make the claim clear.

This claim discloses a method to realize more efficiently compressed zoom input image for the electronic zooming of this invention by compressing at first the circumferential part of the input image to all direction to realize the barrel shaped image, and further compressing the neighboring part of the vertical and horizontal axes of the input image non-linearly to push in the swelled part of the barrel shaped image to get more compressed zoom input image, finally pushed in rectangular outline as is shown in 6B of fig. 6 of this invention.

Hoagland only discloses fiber optical taper that simply compresses rectangular input image to a different aspect ratio rectangular image.

And, Hoagland does not teach any electronic zooming technology to realize more highly and effectively compressed zoom input image by introducing the compressing zoom optical system that compresses to all direction and further compresses the neighboring part of vertical and horizontal axes non-linearly. (Including Col.4, Line55-65, Col.5, Line51-68, Col.6, Line1-32.)

Accordingly the optical taper of Hoagland is perfectly different from the compressing zoom optical system of this invention.

(Claim 11) ;

(Claim 11) Hoagland inherently discloses the optical system (106) is included as an attachment optical system in that optical taper assemblies are not integrated parts of regular lens units.

Claim 11 is corrected to make the claim clear.

This invention discloses a fixed focus input image compressing optical system to realize the non-linearly compressed zoom input image for electronic zooming is included as an attached optical system. But, Hoagland discloses an anamorphic fiber optic taper (106) that is intended to conform the aspect ratio of a input image is included as an attached optical system. And further, Hoagland does not indicate the zooming function of this invention at all.

Accordingly, the function and the structure of the optical system that is included as an attached optical system of this invention that realizes the compressed zoom input image for electronic zooming, is perfectly different from that of Hoagland that conforms the aspect ratio.

Claim Rejections—35 USC 103

12.;

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoagland in view of Lemonier (4962429).

As best understood by the language of the claim, Hoagland discloses an electronic zoom image input method as discussed above, but does not specifically disclose compressing the circumferential part of the input image in logarithmic function.

Lemonier discloses a television camera having an increased resolution in a portion of the field of view wherein compression of the circumferential part of the input image performed in non-linearly according to anamorphic law (Col 5, lines 20-40). Although Lemonier does not specifically state that the non-linear function is logarithmic, it would have been obvious, since a logarithmic function is a well-known non-linear function, to use a logarithmic function as one of the non-linear functions disclosed by Lemonier.

This invention discloses an electronic zoom image input method using a compressed zoom input image, and it is also clearly disclosed in this invention that the anamorphic lens (represented by cinemascope) can not realize such a zoom function and is entirely different from this invention. (Page9, Lines25-31)

And, Hoagland that applies an anamorphic taper does not disclose an electronic zoom image input method that uses such a compressed zoom input image.

Lemonier discloses a television camera, having an increased resolution in a portion of the field of view in one direction by using also a anamorphic lens which distorts the image in accordance with a predetermined low only to a given direction as a anamorphic law (not zooming law for all direction).

In this invention, it is explained that the zoom image is effectively compressed continuously by compressing in logarithmic function (Page 13, Lines2-6). But, in Lemonier even in view of Hoagland, there is no teaching and also no evidence of an electronic zoom function by compressing the image in logarithmic function that is effective to zoom image compressing.

Accordingly, the disclosure of Lemonier in view of Hoagland that is intended to increase the resolution in a portion of the field of view, is perfectly different from this invention that intends to realize an effective electronic zoom function by the logarithmic compression of the input image.

13 ;

13. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoagland in view of Milgram et al (hereafter referred to as Milgram) (5175616).

Hoagland discloses an electronic zoom image input method as discussed above, but does not specifically disclose a 3D image input method whose right and left image input optical systems are organized by fixed focus input image optical systems of the method.

Milgram discloses a 3D imaging method using right and left cameras, each having a n input optical system (see figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made that it is well known in the art to implement a stereoscopic or 3D imaging method using left and right image input optical systems, in the manner taught by Milgram, in order to provide a 3D image.

Hoagland does not disclose an electronic zoom image input method as is described above. And to use right and left cameras for a 3D image have been obvious in the art. But Milgram does not disclose zoom (especially electronic zoom) function for the 3D cameras. Because, in conventional zoom lens, the zooming action that realizes various angles output image requires precise mechanical operation to change its focal length. Especially in the 3D image, accurately synchronized zoom action between the right and left zoom systems that requires precise mechanical operation is needed.

This claim discloses a 3D electronic zoom image input method that realize the 3D zoom operation without using mechanical zoom action by applying a fixed focus zoom input image compressing optical system of this invention.

The anamorphic optical taper of Hoagland in view of Milgram can not teach such a 3D electronic zooming operation of this invention that does not u se mechanical zoom

operations. Consequently, the 3D electronic zooming method of this invention is perfectly different from the disclosure of Hoagland in view of Milgram.

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